



# EtherSync™

## 802.11b PC Card



## User's Guide

**Part Number ETHSC**

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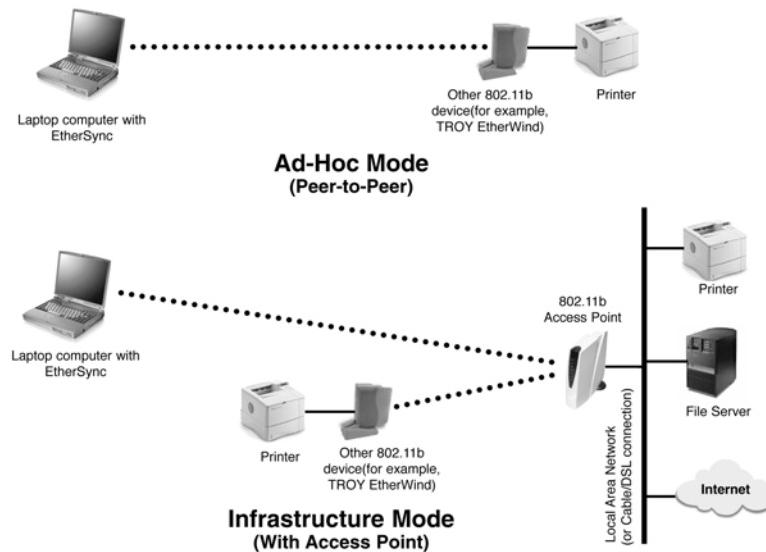
# Contents

Copyright Notice.....	ii
Warranty Notice.....	ii
Trademark Notice .....	ii
<b>Introduction</b>	<b>1</b>
Features Summary .....	1
Windows™ System Requirements .....	2
About Your User's Guide .....	2
<b>1 Getting Started</b>	<b>1-1</b>
Unpacking and Handling .....	1-1
<b>2 Installing the EtherSync Hardware and Driver</b>	<b>2-1</b>
Hardware Installation.....	2-1
Driver Installation for Windows 98 and ME.....	2-2
Driver Installation for Windows 2000 .....	2-5
Driver Installation for Windows XP .....	2-9
<b>3 Configuring the Software on Your Laptop</b>	<b>3-1</b>
EtherSync Utility Installation .....	3-1
Using the EtherSync Utility .....	3-1
Configuration Tab.....	3-3
Link Test Tab.....	3-9
AP (Access Point) Browser Tab .....	3-10
Site Survey Tab.....	3-11
About Tab .....	3-12
<b>4 Troubleshooting</b>	<b>4-1</b>
Frequently Asked Questions .....	4-1
Where to Get Help .....	4-2
Returning Products .....	4-2
Warranty .....	4-3
<b>5 Glossary</b>	<b>5-1</b>
<b>6 Specifications</b>	<b>6-1</b>
<b>7 Notices</b>	<b>7-1</b>
FCC Compliance Statement for United States Users.....	7-1
Declaration Of Conformity .....	7-2
Regulatory Information.....	7-3

# Introduction

The EtherSync PC Card is an IEEE 802.11b-compliant PCMCIA Type II wireless LAN adapter with transmission speeds of up to 11 Mbps. It fully supports wireless networking under Windows 98, ME, 2000 and XP.

The EtherSync can be operated in ad-hoc and infrastructure network environments. In ad-hoc mode, EtherSync users join a Basic Service Set (BSS) without an access point (peer-to-peer configuration). In infrastructure mode, EtherSync users join an Extended Service Set (ESS); that is, users connect to an access point and move from one BSS to another.



For further information and software downloads, visit the TROY Web site at <http://www.troygroup.com>.

## Features Summary

The EtherSync PC Card has the following capabilities and characteristics:

- Supports 1, 2, 5.5 and 11 Mbps data rates.
- Working range up to 90 meters (300 feet) at 11 Mbps in an open environment.
- Direct Sequence Spread Spectrum (DSSS) technology provides robust and interference-resistant wireless connection.
- Supports highly secure 128-bit and 64-bit WEP encryption.
- Includes power management to conserve battery life.
- Supports plug-and-play installation.

## **Windows™ System Requirements**

To use the EtherSync PC Card, your system should include:

- A laptop computer with a Pentium 133 MHz or higher processor.
- At least one free PCMCIA Type II card slot.
- Microsoft Windows 98, 2000, ME or XP.
- At least 64 MB RAM.
- At least 1 MB of free hard disk space to install the software
- A CD-ROM drive

### **NOTICE TO WINDOWS 95 USERS**

Users of the Windows 95 operating system will want to install the earlier version of the TROY EtherSync PC Card driver and Utility software. The files are located in the download area of our Web site at <http://www.troygroup.com>. Should you have any questions, you can also find help from our technical support staff, via e-mail ([support@troygroup.com](mailto:support@troygroup.com)) or by contacting us directly at +1 (949) 250-3280.

## **About Your User's Guide**

This book contains system requirements, important safety information, and instructions on:

- Installing the EtherSync hardware.
- Configuring and using the EtherSync PC Card with a Microsoft Windows system.
- Troubleshooting the EtherSync PC Card.

# 1 Getting Started

There are two components to the installation process of the EtherSync PC Card: installing the software drivers, and installing and running the configuration utility. Windows XP users may find that the Wireless Network Connection tools are sufficient for their environments and may not need to run the EtherSync utility program.

Driver installation instructions are found on the following pages:

Operating System	Page No.
Windows 98 and ME	2-2
Windows 2000	2-5
Windows XP	2-9

See page 3-1 for instructions on how to install and run the EtherSync configuration utility.

## Unpacking and Handling

The EtherSync shipping box contains the following items:

- EtherSync PC Card.
- EtherSync PC Card *Quick Install Guide*.
- Installation CD-ROM with software and *User's Guide*.

The EtherSync PC Card is designed to withstand normal handling procedures, but reasonable precautions should be exercised during installation, particularly with regard to static discharge.

### ESD CAUTION

- Make sure that you are touching a bare metal part of the computer while installing the EtherSync PC Card to ensure that there is adequate grounding.
- Avoid moving around the work area in order to eliminate static charge buildup.
- If possible, do not work on a carpeted area.

# **2** Installing the EtherSync Hardware and Driver

## **Hardware Installation**

1. With the power off, locate an available Type II or Type III PCMCIA slot in your notebook computer.
2. With the EtherSync PC Card's 68-pin connector facing the PCMCIA slot and the label facing up, slide the PC Card completely into the PCMCIA slot.

### **NOTE**

The PCMCIA slot allows you to "hot swap" the EtherSync PC Card. You may therefore insert or remove your EtherSync PC Card from the PCMCIA slot even when the power of your computer is on. However, you should always disable the EtherSync PC Card before you remove it to allow Windows to shut down the driver properly prior to removing the power from the PCMCIA bus.

## Driver Installation for Windows 98 and ME

1. Insert the EtherSync PC Card per the instructions on page 2-1 and turn on the computer. The Windows wizard automatically detects the new hardware and displays the following screen:

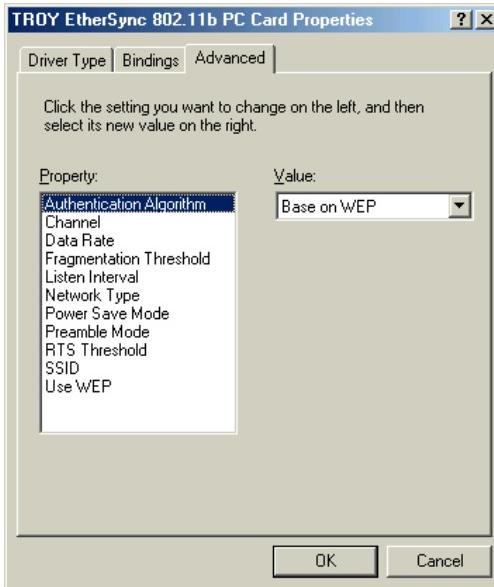


2. Select **Search for the best driver for your device** and click on **Next**.



3. Insert the EtherSync Installation CD-ROM and select the location where the driver is located. We recommend that you use the **Browse** option, which allows you to directly specify the path to the appropriate driver (if you are installing directly from the CD-ROM, typically this is **D:\!**). Then click on **Next** to continue.
4. Windows will identify and display the adapter as **TROY EtherSync 802.11b PC Card**. Click on **Next** to confirm the driver selection.

- Windows may display the Advanced Properties parameters window so that you can set common parameters for the PC Card (if this window is not displayed, continue from step 6 on page 2-3).



Most of these settings can be updated using the EtherSync Configuration Utility, which is the method we recommend; those that can only be updated through this window are described in detail below. You may also display this window from the Windows Device Manager at any time.

*Authentication Algorithm.* The EtherSync PC Card provides two types of authentication services: **Base on WEP** and **WECA Compliant**. **Base on WEP** configures the EtherSync PC Card to use shared key authentication when WEP is enabled. This means that the EtherSync PC Card will communicate with another 802.11b device only if the second device is using a matching encryption key. The **WECA Compliant** option configures the EtherSync PC Card to open systems authentication.

*Channel.* See *Ad Hoc Channel* on page 3-4.

*Data Rate.* See page 3-4.

*Fragmentation Threshold.* See page 3-5.

*Listen Interval.* The listen interval indicates how often the computer will "awake" from sleep mode to receive a control message from an access point. The factory default of "3" indicates that the computer will listen for every third control message.

*Network Type.* See page 3-4.

*Power Save Mode.* See page 3-5.

*Preamble Mode.* Each packet sent over the network is preceded by a string of ones and zeros (a preamble or header) indicating that a packet follows. Newer 802.11b adapters support shorter pREAMbles than those required by older devices. The EtherSync PC Card supports short, long and automatic preamble modes. Although the short mode improves throughput, it must be supported at both ends. The long mode ensures compatibility with older 802.11b or 802.11 DS adapters.

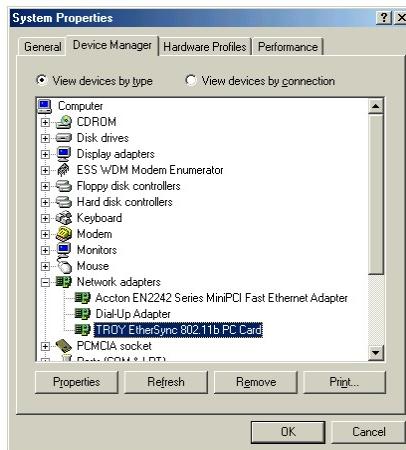
*RTS Threshold.* See page 3-5.

*SSID.* See page 3-5.

*Use WEP.* See page 3-6.

- If the wizard prompts you to insert the Windows disk or CD, direct it to search the appropriate folders.

7. Click on **Finish** and restart the computer to complete the software installation.
8. Use the Windows Device Manager to verify the successful completion of the EtherSync PC Card installation process. Right-click on **My Computer** from the Windows desktop and select **Properties** from the displayed pull-down. Select the **Device Manager** tab and to display the types of devices that might be available (you may not have each of these devices installed). If there is a + next to the Network adapters selection, click on it to display all network adapters (a minus indicates that the adapters are already displayed). The EtherSync PC Card is operational if it is displayed as illustrated in the figure below, with no error icon attached to it.



9. You must now configure the operating system to work with your network software. Generally, this involves going to the Windows **Control Panel**, selecting **Network**, and then enabling the appropriate networking software by specifying required parameters such as the IP address, subnet mask, and the default gateway. Please refer to your network documentation for information regarding this configuration process. When you are finished, reboot the computer.

## Driver Installation for Windows 2000

1. Insert the EtherSync PC Card into the PCMCIA slot per the instructions on page 2-1 and turn on the computer. If prompted for a login, log in as **Administrator**. Windows automatically detects the adapter and prompts you to install the required driver.



2. Click on **Next** to continue. Windows displays the following screen:



3. Select **Search for a suitable driver for my device** as shown above and click on **Next**. Windows displays the following screen:



4. Insert the EtherSync Installation CD-ROM and select the location of the driver. We recommend that you use the **Specify a location** option, which allows you to directly enter the path to the appropriate driver (if you are installing directly from the CD-ROM, typically this is D:\). Then click on **Next** to continue.
5. Windows 2000 displays the adapter as **TROY EtherSync 802.11b PC Card** and displays the EtherSync driver selection.



Click on **Next** to confirm the driver selection.

6. The system may prompt you that the EtherSync driver does not contain a Microsoft Digital Signature (as follows); if you do not see this prompt, continue from step 8.

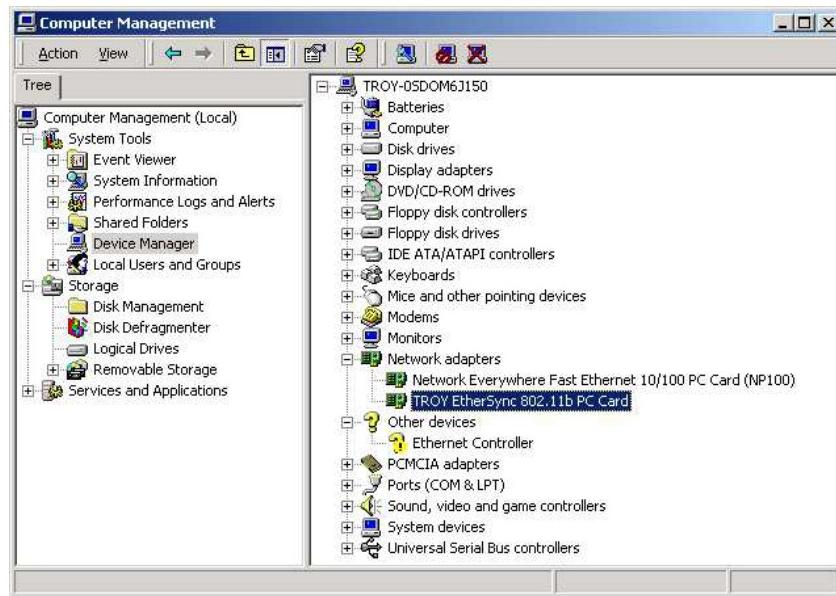


7. Click on **Yes** to continue. Windows displays the following screen:



8. Click **Finish** to complete the software installation.

9. You may use the Windows Device Manager to verify the successful completion of the installation process. From the Windows desktop, right-click on **My Computer** and select **Manage**. On the left side of the screen is a list of tools that can be displayed. Select **Device Manager** to display the following screen:



If **Network adapters** is not displayed as a list (shown above), click on the + next to **Network adapters** to display the various adapters associated with the laptop.

The PC Card is operational if it is displayed as illustrated in the figure above, with no error icon attached to it.

10. You must now configure the operating system to work with your network software. Generally, this involves going to the **Control Panel**, selecting **Network**, and then enabling the appropriate networking software by specifying required parameters such as the IP address, subnet mask, and the default gateway. Please refer to your network documentation for information regarding this configuration process. When you are finished, reboot the computer.

## Driver Installation for Windows XP

1. Insert the EtherSync PC Card into the PCMCIA slot as described on page 2-1 and turn on the computer.
2. Windows automatically detects the adapter and prompts you to install the required driver.



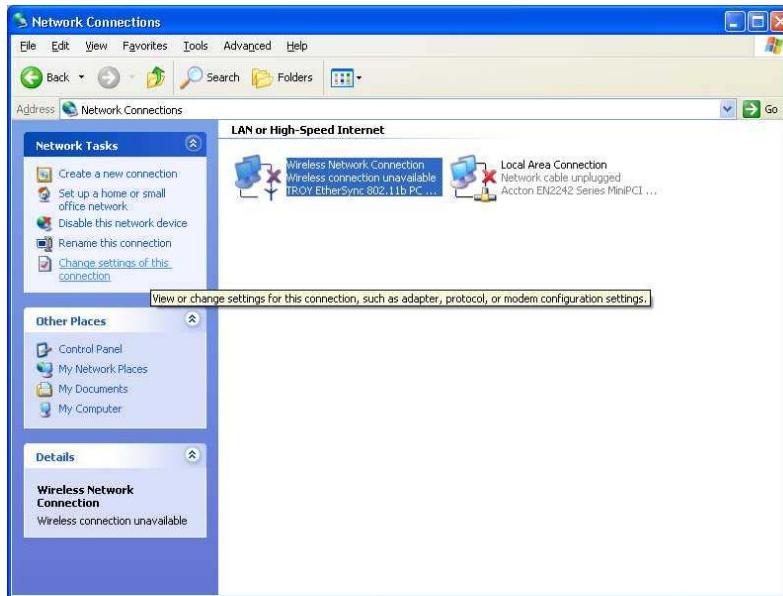
3. Insert the EtherSync Installation CD-ROM. Select **Install the software automatically** and click on **Next** to continue.
4. Windows XP displays the adapter as **TROY EtherSync 802.11b PC Card**. The wizard may identify multiple drivers that are suitable for this device. If this is the case, highlight the driver located in the **winxp** folder. Click on **Next** to confirm the driver selection.
5. The system may prompt you that the EtherSync driver does not contain a Windows Logo signature (as follows); if you do not see this prompt, continue from step 7.



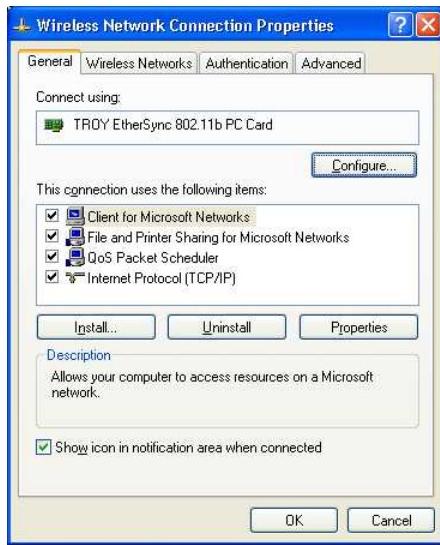
6. Click on **Continue Anyway** to continue. When the installation process is complete, Windows displays the following screen:



7. Click on **Finish** to complete the driver installation.
8. To verify the successful completion of the installation process, select **Control Panel** from the **Start** menu.
9. Select **Network and Internet Connections**, then **Network Connections**.
10. Windows XP displays LAN and high-speed Internet connections on the right side of the screen, and commands you may execute on the left side. Click the **Wireless Network Connection** icon (right side of the screen), then execute the **Change Settings** command (**Network Tasks** pull-down).



11. The system displays the **Wireless Network Connection Properties** screen with the **General** tab selected. Make sure that the system displays the **TROY EtherSync PC Card** in the **Connect using** box and select **Configure**.



12. Windows updates the display to show information about the EtherSync device, and adds a **Device status** box. Confirm that the driver's status is displayed as **working properly** in the **Device status** box.



13. Reboot your computer.

# 3 Configuring the Software on Your Laptop

## EtherSync Utility Installation

1. Insert the EtherSync Installation CD-ROM.
2. Open the **utility** folder and double click on the **setup.exe** icon.
3. Follow the on-screen instructions to complete the utility installation, then double click on the **EtherSync 802.11b Utility icon** or select **Troy EtherSync Utility** from the **Start** menu. This starts the utility interface and you may configure the adapter as described in the following sections.

### NOTE

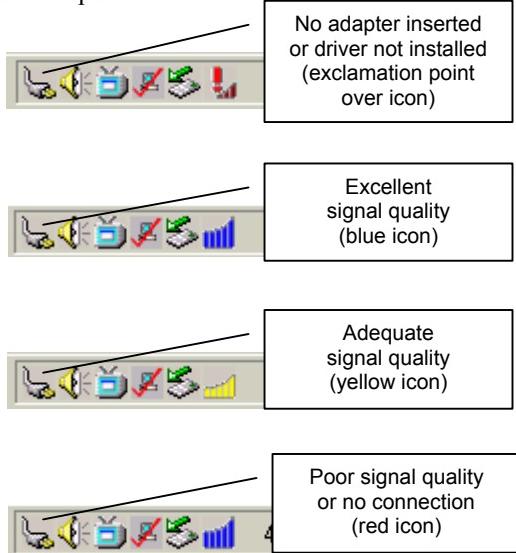
Because Windows XP contains wireless networking capabilities as part of the operating system, some of the features explained below may not be available in the XP environment. Consult your Windows XP documentation for information on how to control those configuration settings.

## Using the EtherSync Utility

The EtherSync PC Card is a plug-and-play device preconfigured for the normal mode of operation in a typical wireless LAN employing access points. Simply follow the instructions in the previous sections, and your EtherSync will be ready to connect to your wireless network infrastructure. In special situations however, you may want to deviate from the default configuration settings. The EtherSync 802.11b Utility allows you to make configuration changes and to run diagnostics in your familiar Windows environment. In addition, you may set up different network profiles to optimize performance when the laptop is used in more than one network environment (such as at home and at work).

## The EtherSync Utility System Tray Icon

When you minimize the main window of the utility, a system tray icon  is displayed in the Windows taskbar. You may simply click on this icon for instant access to your wireless configuration settings. In addition, the taskbar icon also indicates the status of the adapter:



## Navigating the EtherSync Utility

There are five tabs available in the EtherSync Utility:

- *Configuration* is used to set the general configuration parameters associated with the EtherSync PC Card, including the SSID and WEP settings. When you run the utility, the Configuration tab is automatically selected. See page 3-3.
- *Link Test* is used to determine the quality of the wireless link between the EtherSync PC Card and its associated access point. See page 3-9.
- *AP Browser* is used to display information about the various networks available, and to join a particular BSS or ESS. See page 3-10.
- *Site Survey* is used to display the signal-to-noise ratio in the current environment for all 2.4 GHz frequency channels. This display helps you select a channel with the greatest performance capability. See page 3-11.
- *About* provides general information about the EtherSync PC Card. See page 3-12.

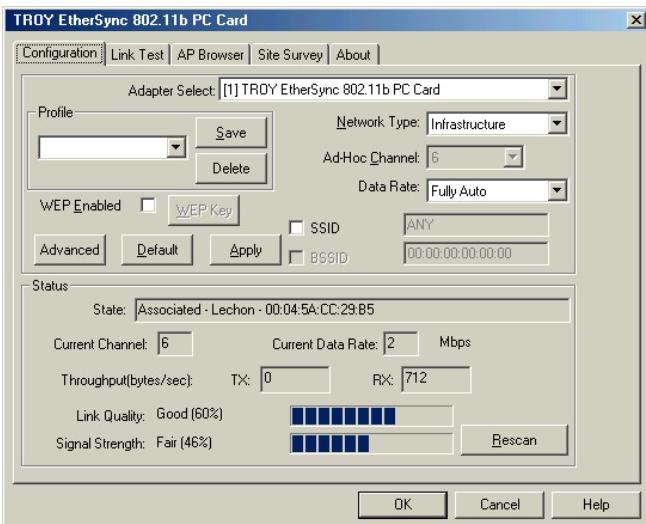
## Configuration Tab

The EtherSync 802.11b Utility configuration tab displays the basic parameters such as the EtherSync's adapter information, network type, and profile. It also features a real-time display of the current connection status, including the frequency channel, current data rate and SSID.

### NOTE

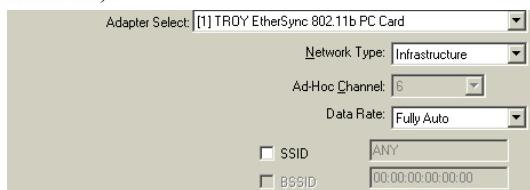
- Always select **Apply** before clicking **Rescan** after making changes to the top half of this screen. Otherwise, your changes will not take effect and the rescan will not show any difference in performance.
- Click **OK** to save your changes and exit the utility.
- Click **Cancel** to exit the utility without saving your changes.
- Click **Default** to return to the factory EtherSync settings.

When you run the EtherSync Utility, the Configuration tab is automatically selected:



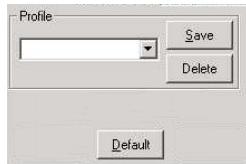
There are five functional regions on the Configuration tab:

- Basic Wireless Parameters (see below).

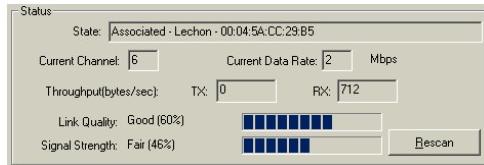


- Advanced Wireless Parameters **Advanced** (see page 3-5).
- WEP Configuration Options **WEP Enabled** **WEP Key** (see page 3-6).

- Profile Definition (see page 3-7).

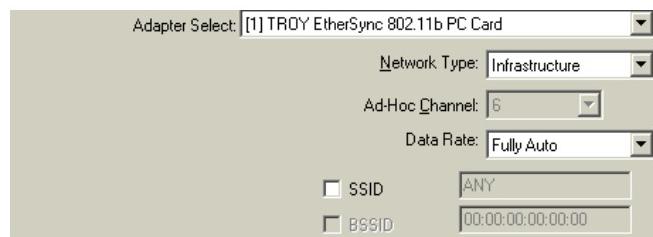


- Connection Status (see page 3-7).



## Basic Wireless Parameters

These parameters designate which network adapter is in use as well as the network type and transmit rate associated with this profile. In addition, the SSID and BSSID joined are designated here.



**Adapter Select.** Use the pull-down to select which wireless adapter is currently in use (when a laptop uses more than one wireless LAN adapter).

**Network Type.** To connect your computer to an existing wireless network infrastructure, set the operation mode of your EtherSync to **Infrastructure** (default setting). An infrastructure network that includes multiple overlapping access points with matching SSIDs will allow you to freely and seamlessly roam within your coverage area.

To establish a stand-alone wireless network, select **Ad-Hoc** and configure all your wireless stations to operate on the same channel. Ad-Hoc mode allows your computer to print straight to an EtherWind enabled printer, eliminating the need to deploy access points.

**Pseudo Ad-Hoc** mode is only used for testing and for backward compatibility with older 802.11b ad-hoc implementations.

**Ad-Hoc Channel.** The channel on which all wireless stations operate in an ad-hoc environment. All wireless peripherals must be set up on the same channel in an ad hoc environment.

**Data Rate.** The EtherSync PC Card supports 11, 5.5, 2 and 1 Mbps data rates. When configured to **Fully Auto** (default setting), it automatically negotiates the highest possible rate. If the quality of the wireless signal drops below a certain level (due to interference, for example) the EtherSync PC Card automatically switches to a lower data rate. Similarly, the EtherSync will automatically recover the data rate if the communications quality improves. Lower speed transmissions are more reliable and provide significantly better range. To balance speed versus reliability, it is possible to force the EtherSync PC Card to operate at fixed 11, 5.5, 2 or 1 Mbps speed. However, in most environments, the **Fully Auto** option is the most efficient.

**SSID.** Select **SSID** and enter the SSID of the access point or wireless ad-hoc network you wish to join. The SSID (sometimes referred to as Network Name or ESSID) must match for all nodes on a subnetwork to communicate with each other.

Alternatively, you may enter **ANY** (all characters must be capitalized), which allows your EtherSync-enabled device to automatically associate to any access point in your vicinity, regardless of its SSID.

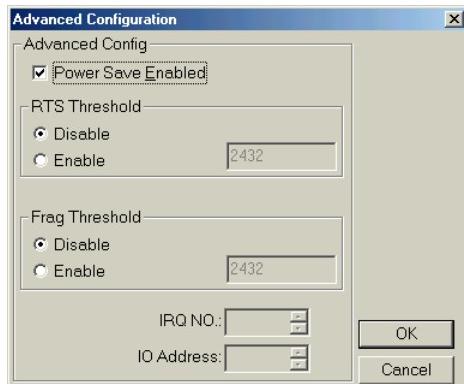
We recommend that you specify an SSID since this prevents your computer from roaming to the wrong wireless subnetwork.

**BSSID.** If your location employs multiple access points with the same SSID, you may also specify the MAC address of the access point that offers the strongest wireless signal in this field.

## Advanced Wireless Parameters

The Advanced parameters, including the RTS and fragmentation thresholds can be used to maximize the performance of the EtherSync PC Card. In most environments, the factory default settings are the best choices for these settings. Users with specific environmental needs (such as environments with two EtherSync stations within range of the same access point but not each other, or environments where there is a high level of interference) may adjust these parameters to fine-tune their network configuration.

When you select **Advanced** from the Configuration tab, the following screen is displayed:



**Power Save Enabled.** When this option is selected, your EtherSync PC Card goes into sleep mode during idle periods to maximize power efficiency and conserve the battery life of your computer.

**RTS Threshold.** This option provides a way to prevent the “Hidden Node” problem. Hidden Node defines a situation in which two EtherSync stations are within range of the same access point, but not within range of each other. When the first station initiates a data transfer with the access point, it cannot notice that the other station might already be using the wireless medium; as a result, there may be a collision. The RTS (Request To Send) protocol overcomes this problem. When enabled, the station sends a medium reservation request to the access point before transmitting any data. The access point then reserves the wireless medium for the requested transmission, if available, and notifies the requestor station of its status. This RTS mechanism can be configured so it will be automatically activated if the packet size exceeds a user-defined value (default setting 2432 Bytes).

Enabling RTS for small packet sizes is not recommended, since it increases the overhead of the wireless protocol that might adversely affect the throughput performance of your system.

**Frag Threshold.** The fragmentation threshold can be used to improve the efficiency of your wireless connection in the presence of heavy interference or when the traffic load is very high. Splitting large data packets into smaller fragments decreases the probability of a collision in many cases, and particularly in environments with a

relatively large number of simultaneous channel contenders. The **Frag Threshold** field accepts values between 256 to 2346 Bytes. The default setting is **Disable**.

*IRQ NO.* This is the interrupt request level assigned by the Windows Install wizard. The field is provided for information purposes only and should not be modified by the user under normal circumstances.

*IO Address.* This is the I/O address assigned by the Windows Install wizard. The field is provided for information purposes only and should not be modified by the user under normal circumstances.

### **CAUTION**

Changing the IRQ or I/O address could cause an internal conflict with another device and may result in the EtherSync PC Card failing to work properly.

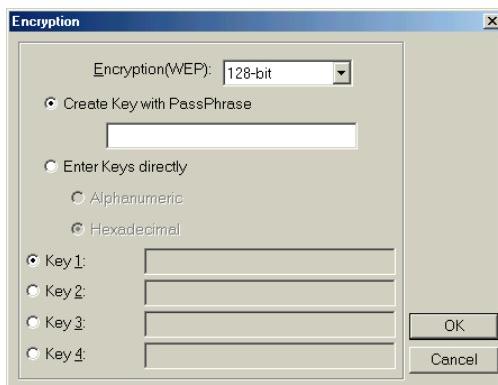
## **WEP Configuration Options**

*WEP Enabled.* To prevent unauthorized wireless stations from listening to data transmitted over the wireless medium, the EtherSync PC Card offers data encryption, commonly referred to as WEP (Wired Equivalent Privacy).

### **CAUTION**

If one part of your wireless network has WEP enabled, all components must also be WEP enabled with the same key or they will not be able to communicate with each other.

To ensure highly secure connections for your wireless transmissions, select **WEP Enable** and the following screen is displayed:



You have the option of having the system generate keys for you using a pass phrase that you enter, or you may manually create your own keys. The system defaults to a pass phrase of "WLAN" which you should change as soon as possible.

*Encryption.* EtherSync supports both 128-bit keys for maximum security and 64-bit keys for compatibility with legacy 802.11b equipment. If you select 128-bit encryption, one key is generated; if you select 64-bit encryption, four keys are generated.

*Create Key with PassPhrase.* This option enables you to generate a secure passkey based on an easily remembered word or phrase.

*Enter Keys directly* You may manually enter WEP keys if you choose not to use a pass phrase. The values you enter will only be visible the first time you edit the keys. After closing this screen, all key values will be displayed as xxxxxxxxxxxx when the window is opened again.

Acceptable 128-bit keys:

- 13 alphanumeric characters in the range of a-z, A-Z and 0-9 (example: WEPEncryption).
- 26 hexadecimal values in the range of A-F and 0-9, preceded by the characters 0x (example: 0x11AA22BB33123456789ABCDEFF).

Acceptable 64-bit keys:

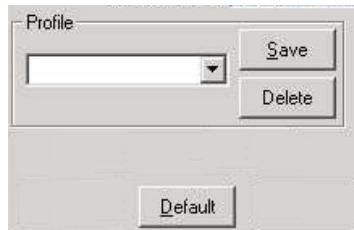
- Five alphanumeric characters in the range of a-z, A-Z and 0-9 (example: MyKey).
- 10 hexadecimal values in the range of A-F and 0-9, preceded by the characters 0x (example: 0x11AA22BB33).

#### NOTE

All 802.11b compliant devices have a way of translating their WEP keys to 10 hexadecimal values (for 64-bit WEP) or 26 hexadecimal values (for 128-bit WEP). The manufacturer of your wireless product can tell you how this is done for your client adapter or access point.

### Profile Definition

Once you have set up the utility with parameters for a specific network environment, you can save those settings as a profile. Different profiles can be set up for use when a computer is used in different environments (such as when a laptop is used both at home and in the office).



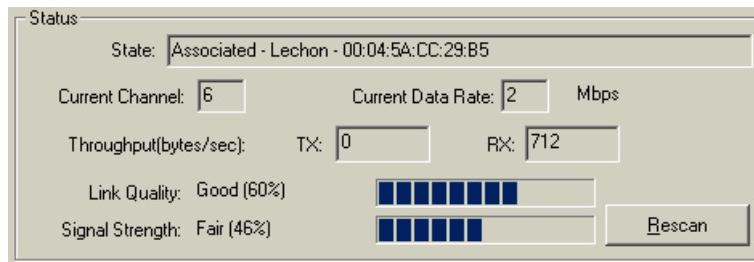
*Create a profile.* Set the basic, advanced and encryption configuration parameters as appropriate for the profile you want to create. Enter a name for the profile and select **Save**.

*Open an existing profile.* Use the pull-down arrow to display previously saved profiles, then highlight and select the profile you want to use. Select **Apply** to change to the new profile.

*Delete a profile.* Use the pull-down arrow to display previously saved profiles, then highlight, select the profile you want to delete and click **Delete**.

## Connection Status

The status block provides information about the current connection between the EtherSync PC Card and the network. After you make changes to configuration parameters in the top region of the screen (or after you select a new profile), select **Apply**. Use **Rescan** to find new and better connections if available.



*State.* This field indicates the status of the connection. **Associated** indicates that the adapter has established a connection with an access point, which will be identified by its SSID and MAC address. **Scanning** indicates that the adapter is currently in the process of searching for the most appropriate connection, whether initiated by a **Rescan** or by you changing a configuration parameter.

*Current Channel.* This is the channel currently in use by the EtherSync device.

*Current Data Rate.* The rate (in megabits per second) at which the EtherSync PC Card is currently configured to pass data through the network. This field is the same as **Data Rate** in the upper region of the screen (see page 3-4). If **Data Rate** is set to **Fully Automatic**, this field indicates the rate currently negotiated by the EtherSync PC Card.

*Throughput.* The actual rate at which data is transmitted (TX) and received (RX) by the EtherSync PC Card.

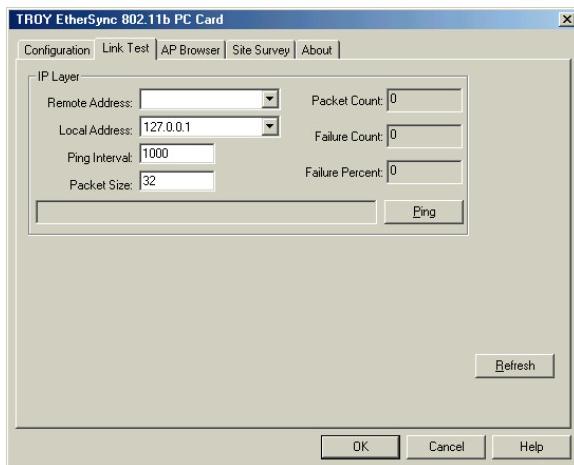
*Link Quality.* This real-time graph shows the quality of the link between the PC Card and the access point, taking into account both signal strength and noise level (signal-to-noise ratio).

*Signal Strength.* The signal level of the last received data packet expressed as a percentage of the maximum signal level.

## Link Test Tab

Select this tab to run a test on how effectively packets are being transmitted. The packet count, failure count and failure percent fields are updated as the test progresses. If the failure percentage is unacceptable, connect to a closer access point, or check for interference with the connection. Use the **Refresh** button to update the display.

1. Select **Ping** to start the test (the bar next to **Ping** shows the command line).
2. Select **Ping** again to end the test.



*Remote Address.* IP address of the "partner" device to be tested. Use the pull-down to select the address of the remote device, or enter it directly.

*Local Address.* Address of this device. Use the pull-down to see a list of possible local addresses.

*Ping Interval.* Interval between ping packets to be sent. The default (1000) means that one ping packet is sent each second.

*Packet Size.* Size (in bytes) of each packet. If this value is set too low, the test may not be meaningful since short packets are generally more successful than longer packets.

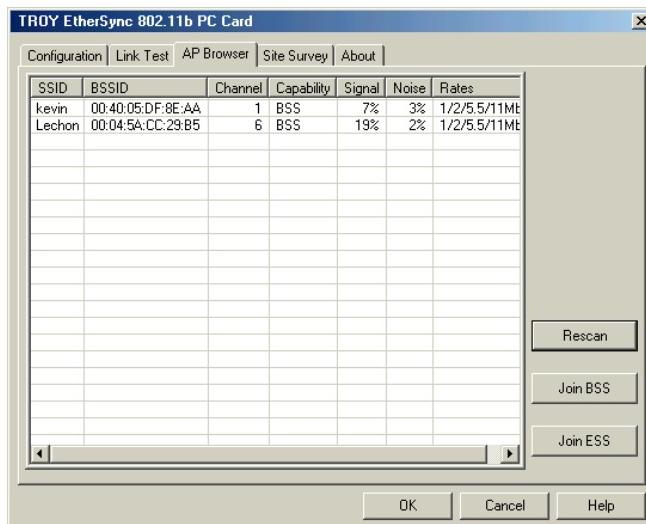
*Packet Count.* Number of packets sent during this test.

*Failure Count.* Number of failures recorded during this test (either the packet did not reach the access point, or there was a problem with the response).

*Failure Percent.* Percentage of failures during this test (based on total number of attempts).

## AP (Access Point) Browser Tab

Select this tab to display information about the various wireless networks available. Highlight a particular network and click **Join BSS** or **Join ESS** to connect to that network. Use the **Rescan** button to update the displayed information.



**SSID.** Network name for the network whose information is displayed on this line.

*BSSID*. MAC address of this access point.

*Channel.* Static frequency channel of this access point.

*Capability.* Identifies whether this is a peer-to-peer network configuration (BSS) or an infrastructure network configuration (ESS).

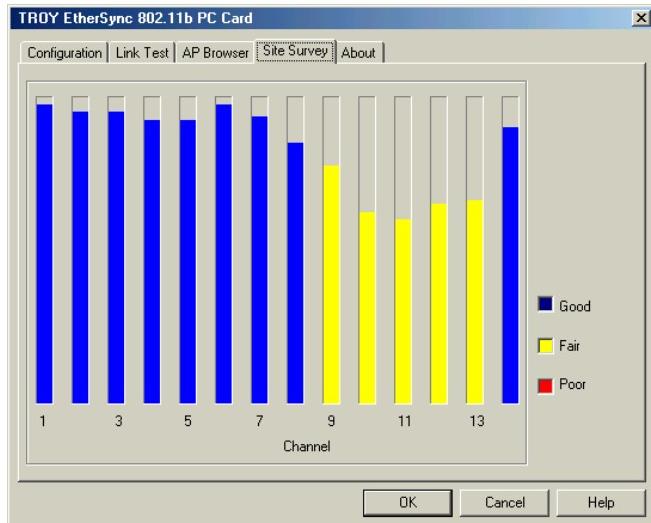
*Signal.* The access point's signal level. Higher numbers indicate stronger signals.

**Noise.** Relative amount of "noise" (interference) on this connection. A high noise level (70 percent or more) indicates that the connection may be subject to interruption.

**Rates.** Data rates available with this access point. Not all access points support all of the data rates available with the EtherSync PC Card (11, 5.5, 2 and 1 Mbps).

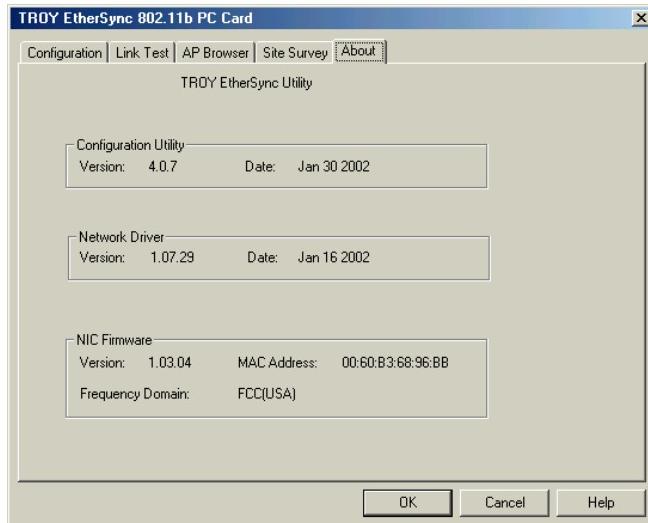
## Site Survey Tab

The Site Survey displays the quality of all 2.4 GHz frequency channels based on the signal-to-noise ratio. Blue indicates the best channels available; red and yellow channels should be avoided, if possible. This display is updated continuously.



## About Tab

This screen displays information about your EtherSync PC Card and Utility that you will need if you contact TROY Wireless Support. In addition, the MAC address of the EtherSync PC Card is displayed on this screen for easy reference.



# 4 Troubleshooting

## Frequently Asked Questions

- Q. How do I communicate directly from a laptop computer with an EtherSync PC Card directly to another 802.11b device (like a TROY 802.11b EtherWind print server) without an access point?
  - A. You will want to make sure that both the PC and the EtherWind operate in ad-hoc mode (sometimes referred to as Peer-to-Peer or Computer-to-Computer Mode).
  
- Q. If I am using a wireless access point, how can I print from a laptop with an EtherSync to a TROY EtherWind 802.11b wireless print server?
  - A. You will want both the print server and the laptop to be in infrastructure mode. Use the EtherSync Utility to set up an infrastructure network as described in section 3.
  
- Q. What if I have both the PC and other 802.11b devices on the network set to the same mode but I can't seem to get a wireless signal?
  - A. You will want to be sure that the SSID matches on all nodes of your wireless network.
  
- Q. You advertise distances of up to 90 meters (300 feet) at 11 Mbps, but I'm not able to communicate at these distances. What is wrong?
  - A. There are many factors that may limit distances, including concrete walls, metal objects, interference from microwaves and other devices operating on the 2.4 GHz spectrum. Three hundred feet is the maximum distance in an optimal environment.
  
- Q. I tried running the Configuration Utility from the Start Menu, and also running it from the Windows system tray, but it won't launch. What is the problem?
  - A. The EtherSync PC Card and driver must be installed before you can run the utility. After the initial installation, the PC Card must be present in the PCMCIA slot in order to run the utility.

## **Where to Get Help**

TROY offers several customer support options to assist you in the event you experience difficulties with your EtherSync, including telephone support, repair services, extended warranty, and advance replacement.

### **Worldwide Web Support ([www.troygroup.com](http://www.troygroup.com))**

The TROY worldwide web site provides a quick and easy way to answer many common technical questions. It includes a wide variety of technical support tips, as well as copies of product manuals, product literature, and firmware load images.

### **Contacting TROY**

Your first point of contact for technical support is the distributor or dealer from whom you bought your EtherSync. They are familiar with your needs, and are generally able to provide you with the fastest and most comprehensive support.

If your distributor or dealer is unable to answer your questions or is not available, contact TROY directly at:

- United States: (800) 923-9535  
(E-mail: [support@troygroup.com](mailto:support@troygroup.com))
- All Other Countries: +1 (949) 250-3280  
(E-mail: [support@troygroup.com](mailto:support@troygroup.com))

Before contacting technical support, please check the Troubleshooting chapter of this manual or the TROY site to isolate any problems, and be sure to write down any error messages. Also, make sure that you have the serial number of the product (located on the product label on the PC Card).

## **Returning Products**

If, for any reason, you need to return a TROY product, first contact TROY at +1 (949) 250-3280 and request a Return Authorization Number from the TROY Technical Support Group. Make sure that you put this number on the outside of the shipping container you use to return the product and (if out-of-warranty) on your purchase order. You will also be asked for the serial number of the defective product. Ship the unit "freight prepaid" to TROY at the address provided by the Technical Support Group (adequate insurance is recommended).

If the unit is not in warranty, you will be billed for the standard repair charges. If you do not have a valid TROY account number, you may be asked for payment in advance (MasterCard, Visa, American Express, check, or money order).

## **Warranty**

TROY EtherSync products are warranted to be free of defects in materials and workmanship for a period of five years. This period begins upon the date of shipment if the Hardware is installed by the Purchaser, or upon installation if the Hardware is installed by TROY. During the warranty period, TROY will repair or replace the unit at no charge provided it is returned to TROY freight prepaid as described in the "Returning Products" section of this chapter. To ensure prompt service, please fill out the enclosed warranty card.

The warranty on repaired products or replacement products is 30 days or the last day of the warranty of the original defective product, whichever is longer.

This warranty does not apply if the Product has been damaged by accident, misuse, natural catastrophe, modification, improper service, or conditions resulting from causes external to the Product. The warranty shall be void if the TROY serial numbers have been removed.

**DISCLAIMER OF WARRANTIES.** THE ABOVE WARRANTIES ARE THE EXCLUSIVE WARRANTIES, AND NO OTHER WARRANTY, EXPRESSED OR IMPLIED, SHALL APPLY. TROY SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

PURCHASER'S SOLE AND EXCLUSIVE REMEDY FOR ANY BREACH OF THIS WARRANTY, REGARDLESS OF THE FORM OF ACTION, WHETHER CONTRACT, TORT, OR OTHERWISE, SHALL BE TROY'S OBLIGATION TO REPAIR OR REPLACE AS SET FORTH ABOVE.

# 5 Glossary

802.11b	The IEEE standard for high speed (11 Mbps) wireless networking at 2.4 GHz.
access point	The access point is a device that connects and passes packets between network devices that are using the same communications protocol. Access points are used in the infrastructure network configuration to connect wireless devices.
ad-hoc network configuration	Peer-to-peer network configuration in which users connect to a basic service set without an access point. In this configuration, each computer on the network performs both client and distribution system functions.
Basic Service Set (BSS)	The BSS provides basic network layer services between nodes in an ad-hoc network configuration.
bit	Binary digit; the smallest unit of data stored in a computer, bits are either "0" or "1".
byte	A series of consecutive bits treated as a single unit, for example, an 8-bit byte.
CD-ROM	Compact Disc Read-Only Memory.
DSSS	Direct Sequence Spread Spectrum; this is one transmission method by which the wireless signal is spread out over multiple frequencies in 802.11b environments.
ESD	Electrostatic discharge; the discharge of stored static electricity can damage equipment and result in complete or occasional failures. Use caution when unpacking and installing the EtherSync PC Card to avoid ESD.
Extended Service Set (ESS)	The ESS provides network layer services between nodes in an infrastructure network configuration.
GHz	Gigahertz; a unit of either electromagnetic or alternating current wave frequency equal to one billion cycles per second.
IEEE	Institute of Electrical and Electronic Engineers; this organization of engineers, scientists and students develops standards for networking and computing, including the 802.11 standards.

infrastructure network configuration	A wireless network configuration in which users connect to an access point and from there to other network components.
IP	Internet Protocol; a method for sending and receiving data between computers on the Internet in which data is split into packets. The IP address is a 32-bit unique number.
IRQ	Interrupt request; IRQs are hardware lines over which devices send interrupt signals to the microprocessor. Although IRQ conflicts can prevent devices from working properly, the Plug-and-Play specification has eliminated most IRQ conflicts. Users are discouraged from changing the EtherSync PC Card's IRQ in order to avoid introducing an IRQ conflict.
MAC	Media Access Control; the MAC address is the standardized data link layer address required for every port or device that connects to a LAN. Other devices in the network use the MAC address to locate specific ports in the network and to create and update routing tables and data structures. MAC addresses are 6 bytes long.
Mb	Megabit; one million bits.
MB	Megabyte; one million bytes.
Mbps	Megabits per second; the transmission rate for the EtherSync PC Card is measured in Mbps.
network layer	The layer that provides connectivity and path selection between two systems. The network layer is the layer at which routing occurs. Packets typically contain network units of data.
NIC	Network Interface Card; this is the hardware device that allows a computer to communicate with the network (the EtherSync PC Card is a NIC).
packet	Packets are the logical groupings of information by which data is transmitted over a network. A packet contains a preamble (header) followed by data. Typically, a packet refers to network layer units of data.
PCMCIA	Personal Computer Memory Card International Association; the PCMCIA developed the standard for the interface bearing its name. These cards are typically referred to as PC Cards.
preamble	Also known as a "header," the preamble contains information placed before data when encapsulating that data for network transmission. The preamble indicates where the packet is coming from as well as where it is going, and is used by network devices to determine which packets are addressed to them.
RAM	Random Access Memory; this is dynamic memory that can be read from and written to repeatedly by a microprocessor.

RTS	Request To Send; the control signal that requests a data transmission on a communications line or wireless medium.
SSID	Service Set Identifier; also known as network name or ESSID.
WEP	Wired Equivalent Privacy; developed by the IEEE, this is the optional encryption protocol used by 802.11 devices. The goal of WEP is to ensure that wireless networks have the same level of security and privacy as wired networks.
Wi-Fi	Wireless Fidelity; the test and certification framework used by many manufacturers of wireless products to ensure that products from different manufacturers can communicate with each other. All TROY products and most 802.11b products are Wi-Fi certified.
WLAN	Wireless Local Area Network; this network type uses radio frequencies for communication and is the type of network supported by the EtherSync PC Card.

# 6 Specifications

Attribute	Specification
Bus Interface	PCMCIA Type II
MAC Protocol	IEEE 802.11
Transmission Scheme	Direct Sequence Spread Spectrum (DSSS)
Data Rates	11, 5.5, 2 and 1 Mbps (auto-fallback)
Range	At 11 Mbps: Up to 300 feet (90 meters) At 1 Mbps: Up to 1,300 feet (400 meters)
Radio Output Power	13 dBm (20 mW)
Frequency Band	2.4 GHz
Frequency Channels	North America: 11 Japan: 14 Europe (ETSI): 13 France: 4 Spain: 2
Voltage	5 VDC
Power Consumption	In transmit mode: 350mA In receive mode: 250mA In sleep mode: 17 mA
Operating Systems	Windows 98, ME, 2000 and XP
Dimensions	5.4 x 0.3 x 12.3 cm (2.1 x 0.1 x 4.8 inches)
Weight	1.5 ounces (42 grams)

# 7 Notices

## FCC Compliance Statement for United States Users

This equipment has been tested and found to comply within the limits for a Class B digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio or television reception. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio and television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver,
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The radiated output power of EtherSync is far below the FCC radio frequency exposure limits. Nevertheless, the EtherSync shall be used in such a manner that the potential for human contact during normal operation is minimized.

### WARNING

The connection of a non-shielded equipment interface cable to this equipment will invalidate the FCC Certification of this device and may cause interference levels which exceed the limits established by the FCC for this equipment. It is the responsibility of the user to obtain and use a shielded equipment interface cable with this device. If this equipment has more than one interface connector, do not leave cables connected to unused interfaces. Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

## For Canadian Users

This Class B apparatus complies with Canadian ICES-003.

Cet appareil numérique de la class B est conforme à la norme NMB-003 du Canada.

## **Declaration Of Conformity**

According to 47CFR, Part 2 and 15 for Class B Personal Computers and Peripherals; and/or CPU Boards and Power Supplies used with Class B Personal Computers:

We: TROY GROUP, INC.

Located at: 2331 S. Pullman St.  
Santa Ana, CA 92705 USA

Declare under sole responsibility that the product identified herein, complies with 47CFR Part 2 and 15 of the FCC rules as a Class B digital device. Each product marketed, is identical to the representative unit tested and found to be compliant with the standards. Records maintained continue to reflect the equipment being produced can be expected to be within the variation accepted, due to quantity production and testing on a statistical basis as required by 47CFR §2.909. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Trade Name: TROY

Type of Product: 802.11b PC Card

Model EtherSync

## **Regulatory Information**

### **For European Users**

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. TROY Group cannot be responsible for any failure to satisfy the protection requirements resulting from a nonrecommended modification of the product.

This product has been tested and found to comply with the limits for Class B Information Technology Equipment according to CISPR 22/European Standard EN55022. The limits for Class B equipment were derived for typical residential environments to provide reasonable protection against interference with licensed communications devices.

TROY hereby declares that the 802.11b wireless technology built into the EtherSync PC Card is in compliance with the essential requirements and other relevant provisions of European Directive 1999/5/EC. The internal function is a radio device using the 2.4 GHz frequency band (2.400GHz – 2.4835GHz). It is intended for wireless communication with other 802.11b-enabled devices. The internal 802.11b technology complies with all applicable regulations FOR INDOOR USE in the following countries: Austria, Belgium, Denmark, Finland, Greece, Germany, Iceland, Ireland, Luxembourg, Norway, Portugal, Sweden,

The use of 802.11b wireless technology in other countries than those listed above may be restricted: before using 802.11b products, please confirm with the frequency management authority in the country where you plan to use it. OUTDOOR USE REQUIRES A LICENSE IN MANY COUNTRIES AND IS FORBIDDEN IN ITALY. In some situations or environments, the use of 802.11b wireless technology might be restricted by the proprietor of the building or responsible representatives of the organization, for example onboard airplanes, in hospitals or in any other environment where the risk of interference with other devices or services is perceived or identified as harmful.

If you are uncertain of the policy that applies to the use in a specific organization or environment, you are encouraged to ask for authorization to use 802.11b wireless technology prior to switching it on. Consult your physician or the manufacturer of personal medical devices (pacemakers, hearing aids, etc.) regarding any restrictions on the use of 802.11b wireless technology.

### **United States of America and Canada**

Tested to comply with FCC Standards FOR HOME OR OFFICE USE. See FCC 47CFR, Part 15.19(b)(2).

This device complies with part 15 of the FCC rules and with RSS-210 / RSS-139 of the Industry Canada.

Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note that any changes or modifications to this equipment not expressly approved by the manufacturer may void the FCC authorization to operate this equipment.

### **Canada (IC notice)**

To prevent radio interference to the licensed service, this device is intended to be operated indoors and away from windows to provide maximum shielding. Equipment that is installed outdoors is subject to licensing.

Pour empêcher un brouillage radioélectrique au service faisant l'objet d'une licence, cet appareil doit être utilisé à l'intérieur et loin des fenêtres afin de fournir un écran de blindage maximal. Au cas où une installation en plein air, le matériel doit faire l'objet d'une licence.